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ABSTRACT

Recent research suggests the importance of social interaction in facilitating knowledge acquisition and transfer. The theory of mediated learning experience has recently been used to develop a teacher-student interactionist model that is especially applicable to high-risk students. In this model, teachers are involved as mediators in: (1) producing cognitive change in children; (2) helping children transcend the immediate situation; (3) communicating the meaning and purpose of activities; (4) helping children feel competent; (5) regulating behavior; and (6) communicating the values of sharing and participation. In a pilot study of 4 community tuition centers in Singapore, an experimental group of 52 students received a combination of mediated learning experience and the usual academic program for 4 months, while a control group of the same size received only the academic instruction. Children averaged 11 years of age. All the students were perceived by their teachers to have difficulty in concentrating; to have poor study skills and work habits; and to lack confidence and motivation. The 15 participating tutors attended a workshop on the mediated learning experience philosophy and received supervision and field coaching. Students were tested using Raven's Standard Progressive Matrices (RPM) and the Cognitive Abilities Test (CAT), and a record of class tests in mathematics and English was compiled. Results showed that mediated learning experience classes in three of the four centers performed better on their school tests in mathematics, but that no significant improvement was noted in English, RPM, or CAT scores. Tutors' responses were more encouraging. (AC)

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ABSTRACT

POTENTIAL OF MEDIATED LEARNING IN THE PRIMARY SCHOOL CLASSROOM - A PILOT STUDY

Recent research on learning suggests the important impact of social interaction in facilitating knowledge acquisition and transfer. Consequently, teachers need a comprehensive instructional model which they can implement in order to improve learning and student performance in the classroom. The theory of mediated learning experience has lately been used in the development of a teacher-student interactionist model for effective instruction.

This paper will identify aspects of the mediated learning theory and programs of Reuven Feuerstein that are especially applicable for 'high risk' students in improving their performance. The relationship between mediated learning and literature on knowledge acquisition and transfer will be discussed and a few encouraging results of a pilot study on mediated learning will be reported.

KEYWORDS: Mediated Learning
Thinking Programme
Cognitive Change

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POTENTIAL OF MEDIATED LEARNING IN THE PRIMARY SCHOOL CLASSROOM - A PILOT STUDY

Mediated learning is directly derived from Feuerstein's Theory of Structural Cognitive Modifiability (see Feuerstein, Rand, Hoffman and Miller 1980). It is an application by teachers in the classrooms of principles of adult interactions, referred to as '<u>mediated learning experiences</u>' (MLE) that are thought to be essential for the adequate cognitive development of children. This is a subtle process in which adults emphasise, interpret, extend and enrich the environment in order that the child can see pieces of experiences meaningfully related to each other. The child builds up his internal mental model of the world around him.

The human intellect, according to Feuerstein, is highly malleable and modifiable at all ages and stages of development. There are two ways in which humans learn. Basic cognitive processes are acquired

a) through 'direct exposure' learning, that is without external mediation through children's direct successive encounters with their environment.

b) through 'mediated learning experience', that is through the mediation by adults of the generalized meaning of salient features of the environment.

The child absorbs <u>direct</u> stimuli in a haphazard random fashion whereas <u>mediated</u> stimuli cannot escape the child's attention and recognition. Through adult mediation, the child is helped to systematize, select and appreciate what to ignore and what to notice.

The role of parents, teachers and significant adults in children's cognitive development represents a major difference between the developmental theories of Piaget and Feuerstein. Piaget advocated direct exposure learning based on the stimulus-organism-response-(S-O-R) framework whereas Feuerstein argues that cognitive development is more crucially affected by mediated learning experiences. He emphasizes the role of parents and teachers (H) in coming between the child and the world of stimuli or the world of responses changing Piaget's S-O-R model into S-H-O-H-R.

Adequate cognitive development is not possible without some degree of mediation provided by parents and/or caregivers. Feuerstein has presented a schematic diagram showing his idea of the 'proximal' and 'distal' etologic conditions that lead to either adequate or inadequate development of the most fundamental cognitive functions (Figure 1).

The 'distal' etologic conditions are according to this scheme, various conditions that have been associated with poverty, neurological impairment, emotional disturbance in child or parents and low educational levels of the parents. However, these conditions themselves do not cause inadequate cognitive development. They are presented as correlates and are often, but not necessarily, associated with inadequate cognitive development. The 'proximal' etologic conditions are responsible for inadequate cognitive development and these are a lack of adequate mediated learning experiences.

When mediated learning experiences (MLE) is sufficient for the individual needs of the child, adequate cognitive development will be the result but when MLE is not sufficient, inadequate cognitive development will result. It was also pointed out that adequate cognitive development can occur in spite of 'distal' conditions when mediation is not sufficient to meet the child's individual developmental needs.

Adequate MLE is therefore a critical condition for adequate cognitive development. The amount depends on the individual needs of children and every child must acquire the basic cognitive functions in order to think logically, to perceive the world in a logical sensible way and to know how to learn and apply what he has learn to new problem solving situations.

The theoretical notion underlying MLE is based on Vygotsky's work who more than 50 years ago discussed the need to identify the child's 'zone of proximal development' which he defined as 'the distance between the actual (mental) developmental level as determined by independent problem solving and the level of potential (mental) as determined through problem solving under adult guidance or in collaboration with more capable peers.' (Vygotsky 1978 p85-86) This zone is a dynamic and sensitive region in which cognitive development takes place. It implies that mental functioning can be carried out in collaboration by several people as well as by an individual.

MLE is a qualitive interaction between the adult caregiver and the child that is not directly and/or exclusively dependent on environmental conditions. In contrast to learning by direct exposure, mediated learning occurs when a mediator interposes himself between the learner and the environment and interprets the world to the learner. Thus MLE is not synonymous with social interaction. The issue is not whether the individual receives stimulus information from inanimate or animate sources but the kind of information that is received. The essence of a mediated interaction is that in the process of mediating information a

transformation occurs that facilitates the transmission of meaning not inherent in the raw stimulus or sensory information.

Feuerstein has suggested six criteria of mediated learning interactions. These are (1) mediation of Intentionality, (2) of Transcendence, (3) of Communication of Meaning and Purpose, (4) of a Feeling of Competence, (5) of Regulation of Behaviour and (6) of Shared Participation.

(1) Under Intentionality, the mediator intends to use the interaction to produce cognitive change in the child. Events and situations are planned and utilised by the mediator so that teaching and learning of concepts and ideas take place.

(2) In Transcendence, the mediator tries to produce cognitive changes that transcend the immediate situation. An event is given generalised meaning by the mediational teacher who attempts to relate it to previous and even future events of a similar nature. In this way a rule is extracted.

(3) For Communication of Meaning and Purpose, the mediator let the children know why one is doing any particular activity. Mediators communicate both the content meaning of events and their generalised relationship to other events. The purpose of the interaction is spelt out clearly to the child.

(4) Under Mediation of a Feeling of Competence, how the child feel about their own competence as learners is extremely important. Appropriate responses are rewarded through acceptance, acknowledgement or praises; and in order that children understand exactly what aspects of their behaviour were good and should be repeated, mediators do not stop at saying 'good' when a child has done well, but might say something such as 'good! you made a plan, so now you know what to do as you go along'.

(5) Children, especially young ones, often require some Regulations of their Behaviour in order to demonstrate their cognitive competence. Impulsive responding is a very common source of error in intellectual work eg. giving answers in class before one has had time to examine the question and the possible solutions. A good mediator helps children to inhibit their impulsive responding and thus to improve the quality of their responses. Another area where regulation of behaviour is needed is when children are unable or unwilling to respond even when the answers are available to the children. Good mediators help children to be willing to give answers, by creating an emotional safe environment.

(6) In Shared Participation, mediators communicate to the children that they are all together in a common quest for intellectual challenge and change. Each participates and shares with one another in the two way interaction.

Mediated interactions are therefore strongly process-oriented. The interactive dialogue is focused on generalisable processes of thinking and learning rather than on answers to immediate problems. Mediators in addition show confidence in children's ability to learn and apply appropriate thinking modes and strategies.

Feuerstein's work on mediated learning began in the early 50s and his Instrumental Enrichment program was developed in the 1960s. Since then, a vast amount of research has been undertaken in North and South America, Europe and Israel, virtually all of it producing evidence to support most of its claims. Pupils have become more competent thinkers although a major stumbling block appears to be its lack of success with teaching for transfer.

Results from the Israeli studies appear more conclusive and what astonished everyone outside the program was the extent of the change in the students when they are retested by the Army two years later. The effects of intervention programs usually diminish over time; in the case of MLE however, effects were more pronounced over time. The students improved in their cognitive abilities and were able to transfer and expand their intellectual organisation of experiences.

There is an important relationship which exists between MLE and children's acquisition as well as transfer of knowledge, based on current literature in this area. The social interaction embedded in any mediated learning situation allows for both general as well as specific forms of knowledge to be acquired and transferred. When mediated learning occurs at an appropriately high level, children learn how to learn (ie. they acquire cognitive functions that are prerequisites to thinking) and develop the capacity to adapt to new situations efficiently and effectively. They are thus actively acquiring new information and applying them cognitively to new situations.

According to Brown and Kane (1988) there are five conditions which are conducive for effective transfer of knowledge. Transfer occurs when (a) learners are shown how problems resemble each other (b) learners' attention is directed to the underlying goal structure of comparable problems (c) the learners are familiar with the problems domains (d) examples are accompanied with rules; particularly when the latter are formulated by the learners themselves and most importantly (e) when learning takes place in a social context... whereby justifications, principles and explanations are socially fostered, generated and contrasted (p 22).

All these five conditions are found in mediated learning and transfer is possible depending on how the knowledge and skills are acquired and how the child faced with a new situation, goes

about trying to handle it.

In this paper, as a pilot study, parts of the MLE programme were presented to a group of children in four community tuition centres in Singapore. MLE may play a critical role as a powerful interaction between the teacher and students and has a potential to influence other school subject domains.

Method

The pilot sample (see table 1) in this study comprising of 104 primary school students was randomly and evenly split into a control and experimental group both of which were tested before and after the experimental programme of MLE was given for a period of four months. The experimental group received a combination of MLE and the usual conventional academic programmes in schools. The control group received only the academic programmes. The students attended classes in the four tuition centres once a week for about two hours each time. These students (average age 11 years old) were considered as slow in learning in schools. They were perceived by their school teachers to have difficulties in concentrating,, to have poor study skills and work habits and to be lacking in confidence and motivation.

15 tutors participating in the programme were exposed to Feuerstein's philosophy and methods by means of a workshop. They received supervision twice a month for the duration of the period when MLE was used. Work on the actual pages of the the programme was interspersed with direct and explicit "bridging" to the academic subjects as well as to everyday life situations. The tutors were given field coaching and follow up sessions and were encouraged to keep anecdotal logs of their pupils. At the close of the training programme, a simple survey of tutors' attitude towards the programme was conducted.

Before the children were started on the programme, all were measured on the Raven's Standard Progressive Matrices (RPM) and the Cognitive Abilities Test (CAT). A record of their class tests in Mathematics and English was also compiled.

Results

The results of this exploratory study provided a little insight on the students' performance and more into the tutors' views and their attitudes towards the programme. Results showed that the MLE classes in 3 out of the 4 tuition centres had done better in their school test in Mathematics. Their English scores however did not show significant improvement. There was also no significant gain in their RPM and CAT.(see Table 2)

The survey of the tutors' attitude towards MLE was most encouraging. 80% of the tutors agreed that the programme aroused interest in their classes and 85% said they thought the programme capable of changing their students' thinking. 90% stated that they had benefitted in their teaching as a result of the training. Another 60% indicated that MLE had improved their students' cooperative skills, mainly due to the group work techniques used.

The tutors' anecdotal logs revealed that the pupils had enjoyed the lessons from MLE very much Some felt that the programme had helped some children to become more thoughtful and less impulsive. However three tutors indicated that some children in their classes wanted to rush ahead on the exercises (kia-su syndrome as known in Singapore) and the three of them had to prepare extra exercises for these children.

All the tutors were unanimous in agreeing that the structured and progressive sequencing of the MLE lessons had been very helpful to their pupils in mainly reducing impulsiveness. It also helped them (the tutors) to plan their work carefully and they became more reflective as a result.

Discussion

The results so far from this preliminary study should be viewed with some caution due to the short period within which the first instrument had been taught and administered to the slower learners. Since the role of the tutor is crucial in producing the necessary mediated learning experiences through the MLE exercises, any teacher indifference or ignorance is bound to have very negative effects.

One major problem is the tendency of the teacher to reduce the MLE set into a series of simple exercises. To carry out the programme properly requires a change in personal attitude, teaching objectives and teaching styles. The process of thinking rather than the product of thinking becomes more important. The programme relies heavily on the continual interaction between teacher and class and between the pupils in the same class. The teacher thus becomes a guide and a participant in problem solving rather than a donor of knowledge.

One of the main problems discussed by the tutors was the difficulty in coping with different levels of ability within the class. It was noted that many of the older children become more willing to engage in discussion whereas the younger children simply enjoy the exercise without gaining anything much. Some tutors apparently found bridging very difficult and they did try hard to prepare a lot of bridging ideas before they started a

a lesson. One particularly interesting finding is that the more experience tutors found the programme requiring a great deal of teacher-direction, class discussion and interaction all at the same time. This was quite difficult for them to carry out.

Preliminary findings seem to suggest that cognitive skills can be transferred to new subjects if children are exposed to MLE for a longer rather than a shorter period of time. For significant changes to take place, a recommended minimum requirement of 300 hours spread out over a two to three year period for all the 14 instruments is suggested by Feuerstein. The training of teachers is obviously very important to the success of this programme. They need to be thoroughly grounded in the theory of mediated learning and cognitive modifiability in order to appreciate the purpose and benefits of the programme in the schools. What this also involves is a commitment to a particular view of learning.

This brief paper has centred on a pilot study on how to activate the cognitive potential in slow learners. It is a small scale investigation still in its exploratory stage. Hopefully it will provide some information about exactly how teachers prepare to work as mediators with small groups of children, exactly what they did and how the children in their groups responded. There are nevertheless other variables which have not been investigated - for example the amount of time necessary to devote to MLE before it begins to take effect or a much more closer monitoring of the control group in the programme.

MLE also needs to be compared and tested with other remedial programmes and since it is based on an interactionist view of development, there is a need for a formative as well as a summative evaluation of the study.

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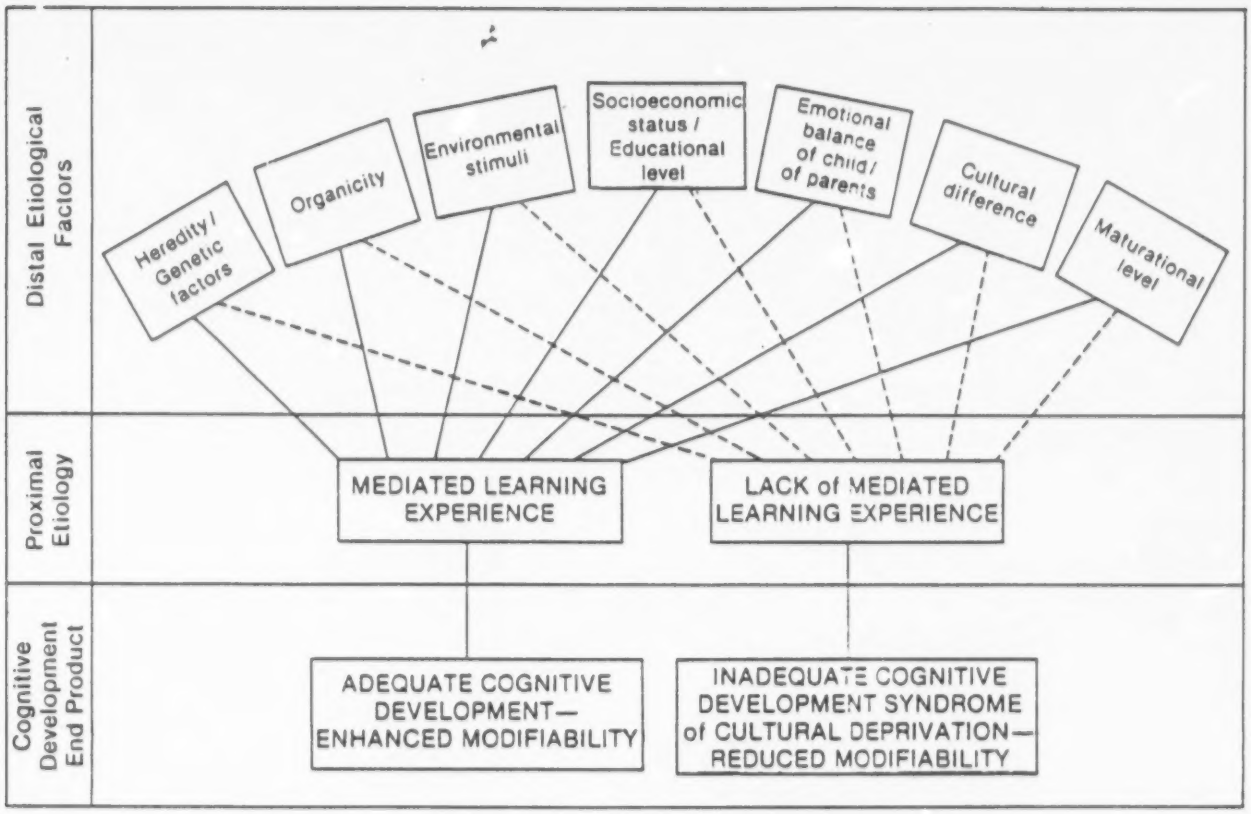

Figure 1. Distal and proximal etiologies of differential cognitive development. (Adapted from Feuerstein and Rand, 1974.)

Table 1: Description of Pilot Sample

Tuition Center	n	Mean Age	Boys	Girls
A	20	10 yrs 8 mths	8	12
B	15	14 yrs 9 mths	8	7
C	30	8 yrs 6 mths	15	15
D	39	9 yrs 9 mths	19	20
Total	104		50	54

Table 2: Students Performance Across Four Tests

Tuition Center	RPM		CAT		Maths		English	
	Exper Group	Contr Group	Exper Group	Contr Group	Exper Group	Contr Group	Exper Group	Contr Group
A		+	+		+		+	+
B					+			
C	+				+			
D	+							

\+ = Positive gain in mean scores (pre to post test).
RPM = Ravens Progressive Matrices
CAT = Cognitive Abilities Test

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